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Pragmatic issues of representation of diseases in BFO

BFO meets critics

Workshop organised by Barry Smith

Ontological vs. linguistic semantics

- The "clean" world of BFO
 - BFO represent universals (types) in reality
 - All entities are either continuants or occurrents
 - Ontologies are not primarily intended to represent the meaning of human language terms

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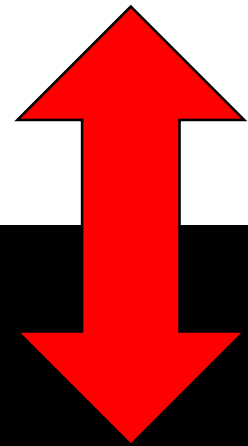
- The "dirty" world of medical documentation

- Use of polysemous terms
- "Clean" inferences

- "Classical" reasoning pattern

Allergic rhinitis is located in the Nasal mucosa
Nasal mucosa is part of Nose

Allergic rhinitis is located in the Nose



Polysemic patterns

- "Dot types"

- PROCESS • OBJECT
- DISPOSITION • PROCESS

INSTITUTION • BUILDING • PEOPLE

1. The university specializes in humanities
2. The university is in the city centre
3. The university is on strike

- Medical examples

- Malignant growth process • Malignant tumour
- Inflammation process • Inflammatory structure
- Allergic disposition • Allergic reaction

- Ontological dependency

- every tumour is the result of some growth process
- every allergic reaction is the realisation of some allergic disposition

Disease, disorder, sickness, illness, maladie, Krankheit, Störung, enfermedad, disturbio..

- ... no clear-cut ontological category or categories
- OGMS, based on BFO, distinguishes
 - *ogms:Disorder* is-a *bfo:Object*
 - *ogms:Disease* is-a *bfo:Disposition*
 - *ogms:Disease course* is-a *bfo:Process*
- In medical discourse and documentation:
 - current use of e.g. "tumour", "inflammation", "sclerosis": no clear commitment to either process or material object
 - In current clinical vocabularies: no consequent distinction (partly between disposition and manifestation, e.g. allergy)

Clinical condition as defined class?

- On the side of BFO: lack of commitment -> disjunctions?

Clinical condition =_{def}

Clinical process \vee *Clinical material object* \vee *Clinical disposition*

- How to formalise this "classical" reasoning pattern?

c instance-of *Clinical condition* at all times

m₁ instance-of *Anatomical object* at all times

m₂ instance-of *Anatomical object* at all times

c located-in **m₁** at **t**

m₁ part-of **m₂** at **t**

c located-in **m₂** at **t**

Wanted for BFO: general inclusion relation

- Valid for dispositions, objects and processes
 - Disposition **d** has material basis **m** at **t** →
d is included in **m** at **t**
 - Disposition **d** inheres in **n** at **t** →
d is included in **n** at **t**
 - Material or immaterial object **o** is located in **m** at **t** →
o is included in **m** at **t**
 - Material or immaterial object **o** is continuant part of **q** at **t** →
o is included in **w** at **t**
 - Process **p** is located in **q** at **t** →
p is included in **q** at **t**
- Would harmonise lexical polysemy with ontological rigor
- Would support classical DL reasoning patterns